

**SUPERJUNCTION DEVICE WITH ADDED CHARGE  
AT TOP OF PYLONS TO INCREASE RUGGEDNESS**

**ABSTRACT OF THE DISCLOSURE:**

The P type pylons in a superjunction device have an increased concentration at their top to modify charge balance, such that the top of the P regions are not fully depleted during blocking voltage operation, while the remainder of the P type pylons are in charge balance with the surrounding N body region. Avalanche current can then be diverted to the central portion of the P body (for N-channel device) channel region at the top of the pylon and away from under the source to increase ruggedness (turn on of the parasitic bipolar transistor due to avalanche current flow through the region under the source) with very little sacrifice of breakdown voltage due to the increased concentration at the top of the pylons.